Designation: D1814 – 70 (Reapproved 2015)

Standard Test Method for Measuring Thickness of Leather Units[1]

This standard is issued under the fixed designation D1814; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This test method covers the measurement of the thickness of units of all types of leather. It is not suitable for measuring the thickness of test specimens.

1.2 The thickness of leather units may be reported in millimetres, ounces, or irons. Ounces are generally used when referring to the thickness of shoe upper leather. Irons are generally used when referring to the thickness of sole leather. (One ounce equals 1/64 in. or 0.0156 in. or 0.396 mm. One iron equals 1/48 in. or 0.0208 in. or 0.53 mm.)

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1813 Test Method for Measuring Thickness of Leather Test Specimens

3. Terminology

3.1 *Definitions:*

3.1.1 *unit*—a piece of leather in the form in which it is purchased, such as a single hide, skin, or part thereof; or a single fabricated-leather article in the form in which it is purchased, such as a counter, a pair of shoes, a gasket, etc.

4. Significance and Use

4.1 This test method is designed for the routine measurement of the thickness of leather units as a means of production control and determining conformance to specifications. It utilizes a secondary type of gage that is capable of rapid measurement.

5. Specimen

5.1 The specimen for measurement shall be the full unit.

6. Apparatus

6.1 *Gage, Spring-Type,* graduated in 0.1 mm or 0.5 oz, having a flat presser foot 0.4 ± 0.025 in. (10.2 ± 0.6 mm) in diameter and a flat anvil 0.4 ± 0.025 in. (10.2 ± 0.6 mm) in diameter. The spring shall exert a force of 1 lbf (4.45 N) on the foot when the gage reads 2 oz, and 2 lbf (8.9 N) when the gage reads 12 oz.

6.2 *Gage, Standard Wedge-Type,* having the two legs graduated alternatively from 1 to 14 and from 1½ to 13½ iron, enclosing an angle of about 4° and 0.425 ± 0.005 mm thick, preferably made from stainless steel.

7. Procedure

7.1 *Leather Other than Sole Leather*—Place the portion of the specimen to be measured between the anvil and presser foot of the spring-type gage (6.1) in such a manner that the specimen is in contact with the whole area of the anvil. With the specimen held in this position, compress the thumb lever of the gage so that the gage reads approximately 15 oz. Allow the thumb to slide off the lever so that the gage presser foot snaps onto the leather. Read the thickness to the nearest 0.1 mm or estimate it to the nearest ¼ oz. Measure the thickness at not less than five approximately equally spaced places along and approximately 6 in. (150 mm) from the backbone. Space the measurements from an initial point of measurement approximately 5 in. (130 mm) in from the root of the tail and the final place of measurement, which shall extend no farther than 130 mm into the neck area.

NOTE 1—If the dimensions of the specimens are such that the gage will not reach from the edge to the point at which the thickness is desired, the specimen may be folded upon itself with the flesh inside. Measure the

[1] This test method is under the jurisdiction of ASTM Committee D31 on Leather and is the direct responsibility of Subcommittee D31.07 on Physical Properties. This test method was developed in cooperation with the American Leather Chemists Assn. (Standard Method E3–1963).

Current edition approved May 1, 2015. Published July 2015. Originally approved in 1960. Last previous edition approved in 2010 as D1814–70(2010). DOI: 10.1520/D1814-70R15.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

thickness of the folded specimen, and take one half of this value as the thickness.

7.2 *Sole Leathers*—Insert the cut edge of the specimen between the legs of a standard wedge-type gage (6.2) so that the plane of the leather is perpendicular to the plane of the gage and bisects the angle formed by the legs. Push the gage over the edge of the leather to make firm contact with the leather so that the gage will stay in position when inverted but not cause any visible deformation of the specimen. Read the thickness to the nearest 0.5 iron at the point where the specimen contacts the legs of the gage. Measure the thickness as follows:

7.2.1 *Bellies*—Gage the specimen at two locations approximately 6 in. (150 mm) to either side of the point opposite the pizzle, or the center of the main width of the belly.

7.2.2 *Shoulders, Double*—Gage the specimen at two places on the cut edge opposite the neck and 6 in. (150 mm) on each side of the backbone.

7.2.3 *Shoulders, Single*—Gage the specimen at one place on the cut edge opposite the neck and 6 in. (150 mm) removed from the backbone line.

7.2.4 *Bend Butts*—Gage the specimen at two places on the cut edge at the shoulder end and 6 in. (150 mm) on each side of the backbone.

7.2.5 *Bends*—Gage the specimen at three places along the backbone starting 12 in. (300 mm) from the root of the tail and at 6-in. (150-mm) intervals from that point toward the shoulder end.

7.2.6 *Backs, Sides, and Crops*—Gage the specimen in at least five places along the backbone, starting 12 in. (300 mm) from the root of the tail and at 6-in. (150-mm) intervals from that point.

7.2.7 *Cut Soles*—Gage the specimens on the fore end (toe), on both sides of the largest width and optionally at the end of the heel (unless the specimens are half soles).

8. Report

8.1 Report the following information:

8.1.1 Thickness of each unit, reported as the average value of the measurements taken,

8.1.2 Thickness of the sample, reported as the average thickness of all the units measured, and

8.1.3 Range of the thicknesses measured.

9. Precision

9.1 If the spring-type gage has been adjusted to read the correct value and is of suitable construction, then the results will have only small errors (±0.05 mm) when used to measure leather up to 5-mm thickness.

NOTE 2—Test the gage periodically by measuring with it the thickness of a rigid material that has also been measured with a standard micrometer or with the instrument described in Test Method D1813. If the spring gage gives a reading that is higher or lower than that of the micrometer-type instruments, adjust it to give the same reading. Readjustment may be necessary if leather to be measured is much thicker than 5 mm.

9.2 The wedge-type gage gives readings reproducible to 0.5 iron when proper precautions are taken during positioning for uniform pressure and avoidance of edge effect.

10. Keywords

10.1 leather; thickness